

- Fig. 2.* The tube that runs through the second sexual gland partly unravelled and freed from its covering: *a*, inferior aperture, *b*, superior aperture of this tube; the last is situated in the sac at the fore part of the accessory or second genital gland. In this sac above is seen at *b* the superior aperture of the duct; here also is *c*, the inferior aperture of the canal, *d. sp.*, which leads to the spermophore-sac.
- Fig. 3.* Vesicle in which a spermophore lay enclosed; of this the convolutions are partially seen through the walls.
- Fig. 4.* A spermophore unravelled, but broken at one of its extremities, here the upper one. The extremity, *a*, is represented in the next figure.
- Fig. 5.* The extremity, *a*, of the last figure, magnified 12 diameters. All the figures except 5 are of the size of nature.

BIBLIOGRAPHICAL NOTICES.

Shells and their Inhabitants. The Genera of Recent Mollusca; arranged according to their Organization. By HENRY and ARTHUR ADAMS. London, Van Voorst, 8vo.

HAPPY the naturalists who have Van Voorst for their publisher! They shall not want for good printing and first-rate illustrations, and their works shall stand on the same shelf with those of the foremost scientific men of the age.

Such was our first thought on turning over the luxurious and costly numbers of this latest book on Conchology. The work is not yet completed, but has so far advanced that we cannot delay noticing it any longer. The first Number was published on January 1st, 1853, and at the present time all the Univalves and higher Mollusca have been described, leaving only the Bivalves and Tunicaries to form the subjects of a future notice.

As a Manual of the genera of Recent Shells it surpasses all its precursors, both in elaborateness of detail and beauty of illustration. To every one who *writes* on shells it will be indispensable, and the only thing to be desired is, that it will be used with discretion, and not followed indiscriminately. The work challenges comparison by its promise to supply a want, and we shall best fulfil our task by stating in what respects its guidance is to be distrusted, and specifying some of the points which require emendation. The authors have still the opportunity of making corrections, and will doubtless be obliged to us for making these suggestions ere it is too late.

The critical examination of these first 800 pages has proved a rather serious business; chiefly on account of the strange nomenclature, and the multiplication and novel arrangement of the genera. All our old conchological notions have been at a discount, and we have had to apply ourselves as to the study of a new art, written in a new language.

The number of univalve *genera* described is about 680, and 437 *subgenera*. The number of species enumerated exceeds 13,000, being rather less than 20 to each genus, and averaging nearly 12 to each genus and subgenus.

The authors have exercised a wise discretion in employing so large a proportion of their names in a *subgeneric* sense. For although this extreme subdivision of natural groups may be useful in a few great collections, and convenient in special or elaborate monographs; yet, for ordinary purposes, a much smaller number of divisions is sufficient. The generic names in general use do not exceed 300 for the whole of the living Encephalous Mollusca; and we are quite sure that no conchologist, or brace of conchologists—not even the authors themselves—will ever learn the eleven hundred and odd names here propounded; especially since so many of them are constructed in a form which takes no hold of the memory, *e. g.* *Neda*, *Aspa*, *Thala*, *Ziba*, *Dinia*, *Sarnia*, *Pœnia*, *Elara*, *Elaira*, *Idesa*, *Alaba*, &c. &c. To the exoteric public this style is by no means attractive, nor is the taste of naturalists in general so far behind that of the rest of the world as to lead them to prefer Adanson as a model.

Of the 18 genera and 121 new subgenera proposed by the authors, there is not one which calls for special notice; they appear to be founded on empirical characters, such as we should have regarded as possessing at most a specific importance.

The list of species appended to each genus and subgenus is one of the principal features of the work. It will be extremely convenient to those who have large collections, and may some time form the basis of what is very much wanted—a Geographical Catalogue of Shells. Of the 13,300 species, probably less than half are in the British Museum; but a larger proportion is in the Cumingian collection, which the authors are understood to have chiefly used. High as this number is, the land snails might now be increased by 1000 names, and some marine genera (like *Cypræa*) are far from complete; but many of the lists are swelled by the introduction of synonyms, varieties, and fossils, and will require considerable revision.

The space occupied by the lists of species exceeds one-fourth part of the work; while nearly another quarter is occupied with headings of various kinds. Thus before reaching the “Woodcock Murex” we encounter the following inscriptions:—

Class, GASTEROPODA.

Subclass, PROSOBRANCHIATA.

Order, PECTINIBRANCHIATA.

Suborder, PROBOSCIDIFERA.

Family, MURICIDÆ.

Subfamily, MURICINÆ.

Genus, MUREX.

Subgenus, HAUSTELLUM.

Species, haustellum.

The objection to this, however, is not so much the space it occupies,

or its technical appearance; but this excessive subdivision annuls the main object of classification, which is the massing of facts under the fewest heads possible. We must not omit to commend the general correctness of the press, which shows the advantage of double authorship. A few typographical errors appear to have been intentionally copied; such as *Onchidium* for *Oncidium*, *Melibe* for *Melibœa*, *Cythara* for *Cithara*, *Stobilus* for *Strobilus*, and *Triphoris* for *Triforis*. At the bottom of p. 64 a sentence is left unfinished; it should continue thus—"side, at the junction between the head and abdomen, with a foot-like appendage. (Gray.)" We have also noticed one paragraph which has quite escaped revision (at p. 15), where six errors occur in a dozen lines*.

The most attractive part of the work, and that of which we can speak with the greatest satisfaction, is the series of illustrations by that excellent engraver and veteran conchologist James D. C. Sowerby. No less than 88 of these admirably-executed plates are devoted to the 680 genera before referred to; the *subgenera* are not figured. Besides the shell of each genus, the *operculum* is given wherever it is known, and representations of the living animals have been selected, especially from the great French works of MM. Quoy and Gaimard, D'Orbigny, and Eydoux and Souleyet. Many of the figures are marked "original," but these are not always the best, and it is to be hoped the author will take a little more pains with any he may do in future†. It must be observed that the *opercula* are all drawn upside down; and no scale is given, so that *Helix pulchella* looks bigger than *H. rufescens*, and nearly as large as *H. cornu-gigantea*.

It will be necessary to examine and consider at some length the *nomenclature* and *classification* employed by the authors, both on account of the importance of their book and the extent to which it differs from the older treatises, especially the 'British Mollusca' of Messrs. Forbes and Hanley, so lately issued from the same press, and which has deservedly taken the highest place as a work of reference and authority.

On comparing the generic names employed by Messrs. H. and A. Adams with the terminology in general use, we find half the principal names (of the *univalves*) changed, on the pretence of *priority*! We say *pretence*, because a very slight examination would have shown that scarcely any of these names were accompanied by descriptions, or otherwise entitled to the adoption of conchologists.

The authors have judiciously omitted *dates*, having doubtless found them a "delusion and a snare;" but the omission of *references*, in so large and pretentious a work, is, to say the least, unusual.

* *Thetis* for *Tethys*; *thecidicola* for *tethydicola*; Bær for Baer; *Lingritula* for *Linguatula*; *Pinnotheros* for *Pinnotheres*; and *Phospuga* for *Phosphuga*. At p. 252, *Chilinia* "Cepuelca" and "pulchra" appear to be misprints for "Tehuelcha" and "Puelcha."

† Some of these figures are obviously taken from specimens in spirits; such as the *Argonauta Oweni*, pl. 2, in which the sail-shaped arm is turned inside out; *Tornatella solidula*, pl. 56. f. 2; and *Pfeifferia micans*, pl. 72. f. 11.

We have added dates, from Herrmannsen*, to the following list of names, showing how long they have been in use. And to the names employed by the authors we have appended a few others of older date, which, according to their own rule, ought to have been preferred.

Names in use.
Hyalea, Lam. 1799.
Cleodora, Peron, 1810.

Creseis, Rang, 1828.
Cuvieria, Rang, 1827.
Clio, Linn. 1767.
Melongena, Sch. 1817.
Pleurotoma, Lam. 1799.
Triton, Montf. 1810.
Ranella, Lam. 1812.
Ricinula, Lam. 1812.
Monoceros, Lam. 1809.
Concholepas, Lam. 1801.
Magilus, Montf. 1810.
Oliva, Brug. 1789.
Ancillaria, Lam. 1811.
Fulgur, Montf. 1810.
Cynodonta, Schum.
Turbinella, Lam. 1799.
Pyrula, Lam. 1799.
Sigaretus, Lam.
Cassidaria, Lam. 1812.
Oniscia, Sby. 1825.
Scalaria, Lam. 1801.
Solarium, Lam. 1799.
Pterocera, Lam. 1799.

Rostellaria, Lam.
Ovulum, Brug. 1789.
Pirena, Lam. 1812.
Paludina, Lam.
Siliquaria, Brug. 1789.
Crepidula, Lam. 1799.
Hipponyx, Defr. 1819.
Neritina, Lam. 1809.
Navicella, Lam.
Phasianella, Lam. 1804.
Rotella, Lam.

Names proposed by Messrs. Adams.
Cavolina, "Gioeni" (not of Bruguière, 1792).
Clio, "Browne" (not. of Linn., Müll., Fabr., Brug., Cuv., Lam., Desh., or any other conchologist of note).

Styliola, Lesueur (teste Blainville).
Triptera, Q. & G. 1824.†
Clione, Pallas, 1774.
Cassidulus, Humph. (not. Lam., Fér., or Latr.).
Turris, Humph. (*Cophinosalpinx*, Kl. 1753).
Tritonium, Link (not Lovén); *Buccinum*, Kl.
Bursa, Bolten (not Bonanni or Petiver).
Pentadactylus, Kl. 1753. (Also *Tribulus*, Kl.)
Acanthina, Fischer, 1817 (*Thais*, Bolten, 1798).
Conchopatella, Chemnitz!
Campylotus, Guett.‡ (*Tubulites*, Davila).
Dactylus, Kl. (*Cylindrus*, Breynius).
Ancilla, Lam. (olim).
Busycon, Bolten.
Vasum, Bolten.
Mazza, Klein.
Sycotypus, Browne, 1756 (*Ficus*, Kl. 1753).
Catinus, Ad. ("Catinus-lactis," Klein).
Galeodea, Link (not Martini or Bolten).
Morum, Bolten, 1798 (*Cassidea*, Brug. 1792).
Scala, Klein.
Architectonica, Bolten (*Nerita*, Kl. 1753).
Harpago, Kl. (Also *Heptadactylus*, *Radix-bryoniæ*, &c.)
Gladius, Kl.
Amphiperas, Gron. 1781 (*Porcellana*, Kl.).
Faunus, Montf. 1810. (Young shell.)
Vivipare, Lam. (olim) *Saccus*, Klein!
Tenagoda, Guett. (*Solen-anguinus*, Kl.).
Crypta, Humph.
Cochlelepas, Kl.
Neritella, Humph. (*Vitta*, Kl. 1753).
Catillus, Humph.
Eutropia, Humph.
Umbonium, Link.

* Index Generum Malacozoorum. 8vo. Cassell, 1846-52.

† This name was given to an imperfect, and misunderstood specimen. In the same plate, and in the same page, the authors figured and described the perfect *Cuvieria* under the name of *Cleodora obtusa*, showing they had no intention of founding a genus (in *Triptera*) equivalent to *Cuvieria*.

‡ We cannot find any such "genus" in Guettard's Memoirs, but according to Blainville it was merely a name given to a miscellaneous assemblage, including *Vermetus*, *Scalaria*, *Magilus*, &c.

Names in use.	Names proposed by Messrs. Adams.
Delphinula, Lam. 1803.	<i>Angaria</i> , Bolten (<i>Cricostoma</i> , Kl.).
Puncturella, Lowe, 1827.	<i>Cemoria</i> , "Leach" (Sw. 1840).
Parmophorus, Bl. 1817.	<i>Scutus</i> , Montf. 1810.
Aemæa, Esch. 1833.	<i>Tectura</i> , Aud. & M.-E. (not defined).
Tornatella, Lam. 1812.	<i>Actæon</i> , Montf. 1810 (<i>Solidula</i> , Fisch.).
Doridium, Meckel.	<i>Aglaia</i> , Renieri.
Umbrella, Lam. 1812.	" <i>Operculatum læve</i> ," Mus. Tessin.
Goniodoris, Forbes.	<i>Doriprismatica</i> , D'Orb. ("voc. pravum," Herrm.).
Antiopa, A. & H.	<i>Janus</i> , Verany.
Embletonia, A. & H.	<i>Clælia</i> , Lovén (not the same thing).
Firola, Brug. 1792.	<i>Pterotrachea</i> , Forsk.
Auricula, Lam. 1799.	<i>Ellobium</i> , Bolten (<i>Auris-Midæ</i> , Kl.).

The names thus introduced by the authors are of three kinds :—some are taken from works published before the time of Linnæus ; others were never characterized, and come under the denomination of "MS. names ;" while a few were published under peculiar circumstances, so as to escape observation, and have become obsolete.

With respect to pre-Linnæan names it is unnecessary for us to advocate the practice adopted by all the best naturalists ; we will only hint the extreme inconvenience of a nomenclature ever liable to change, and ever receding into the obscurity of olden literature. If the names of Klein are to be adopted, why not those of Langius, and Davila, and Breynius, Bonanni, and Petiver ? And if some of Klein's names are used, why not all ?—"Cornu-hammonis" for *Spirula*, "Dontostoma" for *Nerita*, "Auris" for *Haliotis*, "Hamus" for *Tectura*, and "Auricula" for *Linnæa* ? If *Pentadactylus* and *Argo-Buccinum* are to be introduced, why not also *Cophinosalpinx* and *Auris-Midæ*, *Saccus* and *Radix-Bryonia*, *Garagoi* and *Solen-anguinus* ? Have not these also "priority" ? And why is "Catinus-lactis," Klein, to be changed to *Catinus*, since euphony and taste are not to be considered ? The folly of using "Dactylus, Klein," for the olive-shells is conspicuous, because the *Dactylus*, or date-shell, of all the other old writers is that burrowing bivalve the *Lithodomus*.

The question of manuscript names is more difficult, owing to the wilfulness of authors. One says it is sufficient to write a new generic name on a tablet and shut it up in his cabinet,—it is to be *dated* from that act*. Another distinguished Professor, of an English University, holds that to inscribe the name on a *Museum* specimen is a sufficient act of publication, leaving the determination of the date to the memory of the Curator. Some consider the insertion of a new generic name in a catalogue, without a word of description, without even a specific name attached, is sufficient to give "priority." Others, more modestly, admit the desirableness of the addition of a known specific name, but do not consider any description necessary ; any one that pleases may find out the characters of the new genus, and if it has none, it is but one more name added to the synonymy. There

* Introduction to D'Orbigny's 'Prodrome de Paléontologie.'

are other authors besides Rafinesque, who will be remembered chiefly by the spurious genera they have made.

The genera of Humphrey, quoted in the foregoing list, appeared in the "Museum Calonneanum," a Catalogue published anonymously in the year 1797, and containing names only, without definitions. The names attributed to Bolten are also supposed to be taken from a Catalogue, but who has ever seen it? We have found the name "Gevers" placed as the authority for Meuschen's names in the Mus. Geversianum, and "Berlin" for Link's names in the Berlin Museum. But who wrote the "Museum Boltenianum"? The authors have not thought these things worth inquiring into, and we quite agree with them so far.

The Linnæan code, of which Herrmannsen gives an excellent digest, and the Rules of the British Association require that names should be really published, and accompanied by a description sufficient to identify the object and justify the imposition of the new term.

The last case we have to consider is that of names which have been properly defined in the pages of rare and obscure publications, and have remained unknown till discovered by chance after many years. The great work of Pallas, destroyed by fire, and not reprinted for half a century; the MS. of De Blainville's 'Malacologie,' mislaid by Dr. Leach; and Leach's own manuscript, unprinted till its value had nearly departed,—are examples of the casualties which attend authorship. In Messrs. Adams's Genera, we find the authority of Link cited for some names older than those of Lamarck; and it appears by a note of Herrmannsen's that four parts of a little work were printed in 1806-8, and afterwards burnt by their distinguished author; all that we know of them is derived from a solitary copy, found accidentally by M. Mörch, at Lund in Scania. Now, however much we may regret these circumstances, it may well be doubted whether names in general use—names which have been employed in many countries and in many books, and have become familiar as household words—should be changed "in justice to the memory" of authors long since removed from these and all other vanities.

It must not be supposed that the venerable nomenclature employed by our authors has been obtained by a vast amount of research, entitling them to throw off the fetters of the Lamarckian or any other "school." If they have not followed any of the great conchologists, they have borrowed their terminology from a very unpretending source—the Sale-Catalogue of the Yoldi Collection, by a young and enthusiastic native of Copenhagen, Otto Mörch (*angl.* Murk)—where we find all these names, prudently inclosed in brackets, *after those* which would be intelligible to the shell-buying world.

We feel bound to say that we cannot believe these names will ever come into general use; the authors have thrown fresh impediments in the path of the student, and have lost the opportunity of making theirs the chief and standard work on conchological nomenclature.

The classification adopted by Messrs. Adams will be most readily seen by putting in a tabular form, and translating for the convenience

of our readers, the names of those genera only which are regarded as *types of families*, and omitting nearly all the subdivisional names.

Class I. CEPHALOPODA : Order *Octopoda* ; Octopus, Philonexis, Argonauta.

Order *Decapoda* ; Cranchia, Loligopsis, Chiroteuthis, Onychoteuthis, Loligo, Sepia, Spirula.

Order *Polypoda* ; Nautilus.

Class II. PTEROPODA : Order *Thecosomata* ; Hyalea, Cuvieria, Cymbulia, Limacina.

Order *Gymnosomata* ; Clio, Pneumodermon, Cymodocea.

Class III. GASTEROPODA : Order *Pectinibranchiata* (A. *Proboscidifera*) ; Murex, Pleurotoma, Triton, Buccinum, Oliva, Fasciolaria, Turbinella, Voluta, Mitra, Marginella, Dolium, Pyrula, Velutina, Lamellaria, Natica, Cassis, Scalaria, Terebra, Pyramidella, Eulima, Stylifer, Cerithiopsis, Solarium.

(B. *Toxifera*.) Conus.

(C. *Rostrifera*.) Strombus, Cypræa, Ovulum, Pedicularia, Cancellaria, Trichotropis, Aporrhais, Cerithium, Melania, Littorina, Planaxis, Jeffreysia, Rissoa, Paludina, Valvata, Ampullaria, Turritella, Cæcum, Vermetus, Phorus, Calyptræa, Pileopsis, Narica.

Order *Scutibranchiata* ; Nerita, Trochus, Haliotis, Fissurella, Dentalium, Acmæa, Gadinia, Patella, Chiton.

Order *Tectibranchiata* ; Tornatella, Aplustrum, Cylichna, Bulla, Philine, Icarus, Aplysia, Pleurobranchus, Runcina, Pleurophyllidia, Phyllidia.

Order *Nudibranchiata* ; Doris, Onchidoris, Triopa, Tritonia, Proconotus, Æolis, Hermæa, Elysia, Limapontia.

Subclass HETEROPODA ; Ianthina, Macgillivrayia, Atlanta, Firola, Phyllirhoa, Pterosoma.

Subclass PULMONIFERA : (A. *Inoperculata* ;) Glandina, Testacella, Helix, Limax, Stenopus, Arion, Janella, Vaginulus, Onchidium, Auricula, Limnæa, Amphibola, Siphonaria.

(B. *Operculata* ;) Cyclophorus, Helicina, Truncatella, Assiminia.

In the first class, CEPHALOPODA, we see with regret, that the philosophical arrangement and terminology proposed by Prof. Owen has been abandoned for a new and empirical scheme, burthened with such frivolous terms as “Chondrophora,” and “Sepiophora,” &c. The great tetra-branchiate order is termed “Polypoda,” although that phrase was employed by Gistel for the whole of the Cuttlefishes, and is most appropriate to the Octopods—the Polypi of the ancients. It is not contended that the law of priority applies to names of higher than generic importance,—they are formed by rule ; and in the other classes the names of the *Orders* are founded on *branchial* characters.

The first, and most important division of the GASTEROPODA, presents a remarkable scene of confusion, as if the Families had been thrown out of a dice-box. *Pleurotoma* is at the commencement, *Conus* (in a separate suborder) at the end ; *Fasciolaria* is separate from *Fusus*, and *Dolium* from *Cassis*. The shells called “Nassaria” are certainly

Tritons, and have no business with the "Nassidæ." We do not quite see the difference between "Sipho" (Islandicus) and "Euthria" (cornea); our difficulty has always been to know which was the Linneæan species—but now they are distinct genera. *Fastigiella*, at most only a form of *Cerithium*, is placed with *Turbinella* (p. 155), and *Ringicula*, which is known to be related to *Tornatella*, is associated with *Dolium* (p. 197). The authors have rightly hesitated to remove *Philippia* from *Solarium*, although unaware of one reason for keeping them together, viz. that in both the *apex is inverted* and can only be seen by looking into the *umbilicus*; this character affords an additional ground for putting them near *Pyramidella*.

In the second great division of Univalves (*Rostrifera*) we find the *Cypraidæ* placed between *Strombus* and *Aporrhais*, instead of following *Marginella* and *Erato* in the previous order; although amongst the illustrations are figures of *Erato lævis* and *Cypræa europæa*, both copied from Forbes and Hanley, who represent and describe them as being essentially alike.

Planaxis, placed next to the *Littorinidæ*, appears to us more nearly related to *Cerithium*; its lingual dentition also, according to the observations of Mr. Charlton of Gloucester, agrees better with that type.

Fossarus (p. 319) is made to follow *Lacuna*, its natural ally; but *Narica* ("Vanikoro") is placed much further on, at the end of the "bonnet-limpets" (p. 374). We should like to know how to separate these shells; for the distinguishing characters are not given, and many of the species enumerated might with equal propriety be referred to either. The same is the case with *Cyclostrema* (p. 405), and *Adeorbis* (p. 407), which appear to be identical.

Amongst the genera of Pearly Univalves we have been quite bewildered. All the leading facts and general circumstances are frittered away and lost sight of in the mass of petty details—of merely *specific* importance—which are here exalted into most prominent notice. Thus we find a "subfamily," of one genus, with no other character than *operculum ovate* (p. 389), while the next "subfamily" has the *operculum orbicular*.

Passing on to the key-hole limpets, we find fifty kinds of *Fissurella* (including the British species) referred to Gray's genus *Lucapina*, which was certainly not intended for such a rabble. And in describing *Macroschisma*, the authors have forgotten to refer to their usual *vade mecum*, and ventured the original and very unfortunate remark that the "aperture is *much nearer* the front margin than in the other genera of the family"! (p. 447). We thought *Chiton amiculatus* had been the *type* of *Cryptochiton*, but find it placed in a separate "subfamily."

In the Nudibranchiate Order, *Melibæa* and *Doto* are referred to different families, with "Proctonotidæ" between; and the whole treatment of the group is in contrast with the beautiful monograph of Alder and Hancock.

The Subclass HETEROPODA is a remarkable assemblage, including *Ianthina*, which has a dentition and some other characters in com-

mon with *Scalaria*; *Phyllirhoa*, organized like the lowest *Nudibranchiata*; and the fabulous *Pterosoma*, in addition to the *Atlantida* and *Firoliida*, which in some respects resemble the Strombs.

In the Subclass PULMONIFERA the principal novelty is the constitution of the family *Oleacinida*, for which there are good grounds, if it be restricted to the shells usually known as *Glandina*. It may however be doubted whether *Bulimus decollatus* and a hundred others which the authors have included, really belong to the family; least of all should we admit the little *Zua lubrica*, figured as an illustration of the group, and called by mistake "*Oleacina tridens*" (pl. 71. f. 1). On the other hand, they have placed in the same subgenus with the tiny needle-shell (*Cionella acicula*) the great *Glandina Algira*, which has a lingual organ as large as that of the *Testacella*, armed with equally formidable teeth, arranged in V-shaped rows. In the list of species we observe the *Achatina cylichna* of Lowe, which is a fossil; while the *Achatina gracilis* of the same author figures in three places, as *Oleacina (Azeca) terebella*, again as *Glandina (Acicula) gracilis*, and, 200 pages further on, as *Acicula gracilis*.

In the family *Auriculida* ("Ellobiida," Adams) we searched for our twin British species *Conovulus denticulatus* and *bidentatus*, which when young are so alike, but found no such name as *Conovulus*, although we encountered some strange characters called *Pira*, *Tifata*, *Signia*, and *Persa* (the name-maker must have been terribly hard up!); at length we discovered our old acquaintances, under the disguise of *Leuconia* and *Alexia*, in two distinct subfamilies.

Lastly, we must confess that the position of *Truncatella* and *Assimineia* with the Pulmoniferous land snails is utterly beyond our comprehension at the present instant.

In the Prospectus attached to the first number of this work, the authors have very truly stated that at the present day there is a very general wish shown by zoological students to learn something of "the habits, organization, and affinities of the animals which construct shells." We have always found that those who took a hearty interest in shells, were still more interested in shell-fish, and without going into anatomical researches, there was enough in the study of external or zoological characters to afford very high gratification. Every one knows, who has studied natural history, that this pleasure is personal, and independent of utilitarian considerations or the stimulus of ambitious competition.

The Zoological Illustrations, and abridged descriptions of the animals of the genera, are certainly the most valuable portion of the work, and reflect the greatest credit on the industry and skill of authors and artist. We have had opportunity of seeing the pains taken by Mr. Sowerby to make the best of his materials. The paragraphs relating to structure, physiology, and habits, are scarcely so satisfactory as might have been expected from the profession of one of the authors, and the promise in the prospectus. The signs of compilation are obvious at every step, and too often of unintelligent compilation. In the first chapter the metamorphosis of the Gasteropoda is described as applying to *all* Mollusca (p. 7). The tongue of the carnivorous Gasteropods is said to be "forked and fleshy,"

while in some others it is coiled spirally "in the stomach;" the *Tunicata*, we are told, have no tongue. Some of the technical terms are used in such a sense as to require a special glossary; thus (at p. 13) some opercula are said to be "annular and multispiral," while in other places (*e. g.* p. 345) *concentric* opercula are called "annular." In plain English "annular" means like a ring, *i. e.* with a hole in the middle, and "no operculum presents an annular form*." At p. 14 we are informed, "the *epidermis*, like that of other animals, is inorganic, and cast off occasionally by the animal," and the shell itself is called "epithelium." At p. 18 the *Octopoda* are defined as having "foot none;" but to make up for it, at p. 16, they have "ears developed." This last announcement would have amazed us more, but for the recollection of the phrase "auricular crests" employed by D'Orbigny for the little processes on the sides of the head in some Calamaries, and which have as much to do with *hearing* as the "ears" of the sea-hare. Under the genus *Achatinella* it is stated that "the females are ovo-viviparous" (p. 136), and again under *Partula*, "the females produce their young alive" (p. 145); we will not ask what the males are.

The references to fossil shells are few, and would have been better omitted, as the authors appear to have had no experience in such matters. They are certainly wrong in referring *Marginella pellucida* to the extinct genus *Volvaria* (p. 194); and are evidently misinformed about *Discohelix* and *Serpularia*, or they would not have described recent shells under those names.

Not much is made of the geographical distribution of the genera; at first the notices are very few and loose, but are more frequent afterwards, as the subgenera of land shells were chiefly founded on geographical considerations. We do not know what was intended by "north coast of America" given as a locality of *Oleacina*; but at p. 92, for "low latitudes" we should read "high." *Tornatellina* is said to be found in Madeira, but the only Madeiran species is removed to another family.

Most writers, especially when their publications extend over several years, become more cautious as they proceed, and we hope soon to congratulate the authors on the completion of their work in a style improved by experience; we shall do so more heartily if they will use the opportunity afforded by their preface and appendix to acknowledge and correct such things as may yet be rectified.

Das Gebiss der Schnecken, zur Begründung einer natürlichen Classification, untersucht von Dr. F. H. TROSCHEL, Professor an der Universität zu Bonn. Erste Lieferung, mit vier Kupfertafeln von HUGO TROSCHEL. Berlin, 1856, 4to.

Dr. Troschel says that he has devoted twenty years to the study of the teeth of Mollusca, and laboured to collect every material that could throw light on the subject. He considers that there are now two classes of students, conchologists and malacozoologists; the latter take the only imperishable, unchangeable organ of the molluscous animal

* Owen, Hunterian Lectures on the Invertebrata, p. 543.